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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,457	01/25/2002	Timothy Lee Kelly	MEW1911/064	4128

7590

06/05/2003

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EXAMINER

LEURIG, SHARLENE L

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/056,457

Applicant(s)

KELLY, TIMOTHY LEE

Examiner

Sharlene Leurig

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5, 6 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Thornton, Jr. et al. (4,360,758).

Regarding claim 1, Thornton, Jr. discloses a metal halide lamp having superior red rendering characteristics, comprising an arc tube formed of a material transmissive to visible radiation (column 3, lines 54-55), a fill of metal halides comprising  $\text{CaI}_2$ ,  $\text{GaI}_3$ , and  $\text{TlI}$  (Table III, arc tube number 18), and discharge electrodes disposed at opposite ends of the arc tube (column 3, lines 56-57).

Regarding claim 4, Thornton, Jr. discloses an arc tube made of quartz (column 3, lines 54-55).

Regarding claim 5, Thornton, Jr. discloses an arc tube surrounded by a glass envelope (column 3, lines 62-63).

Regarding claim 6, the envelope contains a fill gas of nitrogen at a pressure of 300 torr, which falls within the claimed range of 250 to 600 torr (column 3, line 65).

Regarding claim 12, Thornton, Jr. discloses a lamp with a fill that can be sodium-free. Although Thornton, Jr. discloses sodium as a possible halide fill (column 1, lines 22-26), many of the disclosed fills contain no sodium (Table III)

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Lorenz conference paper (of record) in view of Wada et al. (5,256,940) (of record).

Lorenz discloses a metal halide lamp having superior red rendering characteristics, containing a fill of metal halides comprising  $\text{CaI}_2$ ,  $\text{AlCl}_3$ , and  $\text{TlI}$  (page 139, second filling on bottom graph). Lorenz discloses that while aluminum iodide has too low of a heat of dimerization for use in the disclosed metal halide lamp, aluminum bromide and aluminum chloride have similar properties that result in a higher vapor pressures that are suitable for the disclosed lamp (page 138, column 1, lines 5-9). Though Lorenz favors aluminum chloride as the aluminum halide, he also discloses that chloride has a tendency to cause problems that result in a decrease in luminous efficacy (page 140, column 1, last paragraph). Lorenz lacks explicit disclosure of the use of aluminum bromide in the lamp.

Wada teaches the use of either aluminum chloride or aluminum bromide in a metal halide lamp (column 4, lines 23-26).

Despite disclosing a metal halide lamp, Lorenz lacks explicit disclosure of a light-transmissive arc tube containing a pair of electrodes.

Wada further teaches a lamp comprising an arc tube (Figure 1, element 11) formed of a material transmissive to visible radiation and discharge electrodes (12 and 12a) disposed at opposite ends of the arc tube.

Regarding claim 4, Wada teaches an arc tube formed of quartz (column 2, line 62).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lorenz's lamp with an arc tube and electrodes to produce a functioning and complete lamp, and to further modify it with aluminum bromide instead of aluminum chloride since it has been shown in the art that the two are similar enough to be interchangeable.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton, Jr. et al. (4,360,758) (of record) in view of Wada et al. (5,256,940) (of record).

Thornton, Jr. discloses a metal halide lamp with all the limitations discussed above, including a fill that may contain tin iodide (column 3, lines 9-10), but lacks a fill containing an aluminum halide. Thornton, Jr. further discloses a fill comprising mercury and argon (column 4, lines 50-55) and  $\text{CaI}_2$  in a molar quantity of 74%, which falls within the claimed range of 10 to 75% of the total molar quantity of the total halides,  $\text{SnI}_2$  in a molar quantity of 19.4%, which falls within the claimed range of 10 to 75% of the total molar quantity of the total halides, and  $\text{TlI}$  in a molar quantity of 6.6%, which falls within the claimed range of 5 to 50% of the total molar quantity of the total halides. The numbers calculated above are for only one example disclosed by Thornton, Jr. Arc tube

5 was chosen as an example because of its high lumens per watt, given in Table I. The wider range of fill constituents is given in column 3, lines 6-12. Please see the enclosed sheet of calculations.

Thornton, Jr. lacks disclosure of a fill containing an aluminum halide.

Wada teaches a metal halide lamp having an aluminum chloride fill component, and further teaches that any of the following halides can be used instead of aluminum chloride: tin iodide, aluminum iodide, or aluminum bromide (column 4, lines 23-26).

Therefore Wada teaches that aluminum iodide and aluminum bromide are interchangeable with tin iodide.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thornton, Jr.'s lamp having tin iodide with aluminum bromide or aluminum iodide, since Wada teaches that those halides are interchangeable. The range disclosed by Thornton, Jr. (column 3, lines 6-12) is wide enough that despite the difference in molar weight between tin iodide and either aluminum bromide or aluminum iodide, one of the disclosed arc tube fill ratios, when tin iodide is substituted with aluminum iodide or bromide, would fit within the claimed range.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton, Jr. (4,360,758) (of record) in view of Kramer et al. (4,801,846) (of record).

Thornton, Jr. discloses a metal halide lamp with good red rendering characteristics.

Thornton, Jr. lacks a fill containing rare earth halides.

Kramer teaches a fill comprising mercury, a calcium halide, an inert gas and rare earth halides to yield a lamp with good red emission. The rare earth components taught include Dy, Ho and Tm (column 4, line 19).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thornton Jr.'s lamp with rare earth halides such as those of Dy, Ho and Tm, as taught by Kramer, to further improve the lamp's lighting characteristics.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz conference paper (of record) in view of Wada et al. (5,256,940) (of record) as applied to claim 1 above, and further in view of Kramer et al. (4,801,846) (of record).

Lorenz discloses a lamp with all the limitations discussed above but lacks a fill containing aluminum bromide or aluminum iodide. Wada teaches a fill of aluminum bromide or aluminum iodide. Both Lorenz and Wada lack a fill containing rare earth halides.

Kramer teaches a fill comprising mercury, a calcium halide, an inert gas and rare earth halides to yield a lamp with good red emission. The rare earth components taught include Dy, Ho and Tm (column 4, line 19).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lorenz's lamp with an aluminum halide such as aluminum bromide or aluminum iodide, since it has been shown that they are interchangeable with

aluminum chloride, and to further modify it with rare earth halides such as those of Dy, Ho and Tm, as taught by Kramer, to further improve the lamp's lighting characteristics.

8. Claims 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton, Jr. et al. (4,360,758) (of record) in view of Tsuda et al. (2002/0063503 A1).

Thornton, Jr. discloses a metal halide lamp with good red rendering characteristics, but lacks a protective shroud.

Regarding claim 7, Tsuda teaches a shroud surrounding the arc tube to prevent glass shards from shattering the lamp in case of explosion (page 3, paragraph 0041) and further to block infrared light and yellow light from being emitted (page 4, paragraph 0059).

Regarding claim 9, the shroud is cylindrical in shape (Figure 1, element 30).

Regarding claim 10, Tsuda teaches a shroud coated with a reflective film to filter out yellow light (page 4, paragraph 0060) to produce a more uniform light. The claimed range of 585 nm with a half peak bandwidth of between about 5 and 40nm is the same range as yellow light.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thornton Jr.'s lamp with a shroud to protect the viewer in case of explosion of the arc tube, as taught by Tsuda, and to further modify it with yellow filtering capabilities to produce more uniform light.



9. Claims 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz conference paper (of record) in view of Wada et al. (5,256,940) (of record) as applied to claims 1 and 4 above, and further in view of Tsuda et al. (2002/0063503 A1).

Lorenz discloses a lamp with all the limitations discussed above but lacks a fill containing aluminum bromide or aluminum iodide. Wada teaches a fill of aluminum bromide or aluminum iodide. Both Lorenz and Wada lack a shroud surrounding the arc tube.

Regarding claim 7, Tsuda teaches a shroud surrounding the arc tube to prevent glass shards from shattering the lamp in case of explosion (page 3, paragraph 0041) and further to block infrared light and yellow light from being emitted (page 4, paragraph 0059).

Regarding claim 9, the shroud is cylindrical in shape (Figure 1, element 30).

Regarding claim 10, Tsuda teaches a shroud coated with a reflective film to filter out yellow light (page 4, paragraph 0060) to produce a more uniform light. The claimed range of 585 nm with a half peak bandwidth of between about 5 and 40nm is the same range as yellow light.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lorenz's lamp with an aluminum halide such as aluminum bromide or aluminum iodide, since it has been shown that they are interchangeable with aluminum chloride, and to further modify it with a shroud having yellow filtering capabilities to produce more uniform light, as taught by Tsuda.

10. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton, Jr. et al. (4,360,758) (of record) in view of Tsuda et al. (2002/0063503 A1) as applied to claims 7 and 9 above, and further in view of Hirano et al. (4,315,186).

Thornton, Jr. discloses a metal halide lamp with good red rendering characteristics, but lacks a protective shroud. Tsuda teaches a shroud made of glass but lacks explicit disclosure of a borosilicate glass. Tsuda further lacks a shroud made of glass containing neodymium.

Hirano teaches a lamp with a reflective surface made of borosilicate glass (column 2, line 32) doped with neodymium, which is chosen for its yellow-filtering capacity (light around 580 nm) (column 2, lines 46-48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thornton Jr.'s lamp with a shroud having yellow filtering capabilities to produce more uniform light, as taught by Tsuda, and to further modify it with a shroud made of borosilicate glass doped with neodymium, as taught by Hirano, to thereby produce a lamp with a yellow-filtering shroud whose filtering is integral to the glass itself and not to filtering films that may degrade over time.

11. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz conference paper (of record) in view of Wada et al. (5,256,940) (of record) and further in view of Tsuda et al. (2002/0063503 A1) as applied to claims 7, 9 and 10 above, and further in view of Hirano et al. (4,315,186).

Lorenz discloses a lamp with all the limitations discussed above but lacks a fill containing aluminum bromide or aluminum iodide. Wada teaches a fill of aluminum bromide or aluminum iodide. Both Lorenz and Wada lack a shroud surrounding the arc tube. Tsuda teaches a shroud made of glass but lacks explicit disclosure of a borosilicate glass. Tsuda further lacks a shroud made of glass containing neodymium.

Hirano teaches a lamp with a reflective surface made of borosilicate glass (column 2, line 32) doped with neodymium, which is chosen for its yellow-filtering capacity (light around 580 nm) (column 2, lines 46-48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lorenz's lamp with an aluminum halide such as aluminum bromide or aluminum iodide, since it has been shown that they are interchangeable with aluminum chloride, and to further modify it with a shroud having yellow filtering capabilities to produce more uniform light, as taught by Tsuda, and to further modify it with a shroud made of borosilicate glass doped with neodymium, as taught by Hirano, to thereby produce a lamp with a yellow-filtering shroud whose filtering is integral to the glass itself and not to filtering films that may degrade over time.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton, Jr. et al. (4,360,758) (of record) in view of Wada et al. (5,256,940) (of record) as applied to claim 2 above, and further in view of Kramer et al. (4,801,846) (of record).

Thornton, Jr. discloses a metal halide lamp with all the limitations discussed above, including a fill that may contain tin iodide (column 3, lines 9-10), but lacks a fill

containing an aluminum halide. Wada teaches an aluminum halide fill, as discussed above regarding claim 2. Both Thornton, Jr. and Wada lack rare earth halides in the fill.

Kramer teaches a fill comprising mercury, a calcium halide, an inert gas and rare earth halides to yield a lamp with good red emission. The rare earth components taught include Dy, Ho and Tm (column 4, line 19).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thornton Jr.'s lamp with an aluminum halide such as aluminum bromide or aluminum iodide, since it has been shown that they are interchangeable with tin iodide, and to further modify it with rare earth halides such as those of Dy, Ho and Tm, as taught by Kramer, to further improve the lamp's lighting characteristics.

### ***Conclusion***

The prior art made of record and not relied upon is considered to be pertinent to the applicant's disclosure. If the applicant wishes to review a former patent on the interchangeable nature of aluminum halides and gallium halides, USPN 4,672,267 to Lapatovich et al. is cited of interest.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig  
June 1, 2003



VIP PATEL  
PRIMARY EXAMINER